



# Chemotherapy education: current practices of oncology nurses counseling patients

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## Abstract

**Purpose** Chemotherapy education provided by nurses to patients is a fundamental component of high-quality cancer care. The Quality Oncology Practice Initiative (QOPI®) provides guidance on treatment-related aspects of chemotherapy education (diagnosis, goals, regimen, schedule, adverse events, follow-up), but recommendations on practical lifestyle issues lack evidence and standardization.

**Methods** An anonymous, voluntary, uncompensated survey was distributed in October 2019 to 12,995 oncology certified nurses who report working in adult outpatient clinic/infusion room settings. An electronic survey was designed to determine current practice in nurse-patient counseling related to lifestyle and behavior during chemotherapy treatment.

**Results** Survey responses were obtained from 1243 oncology certified nurses (9.6%). Nurses reported that their education practice was influenced by their institution and coworkers (other nurses or oncologists). Most nurses (> 50%) reported counseling on all topics asked. Most frequently counseled topics included water intake, infection monitoring, alcohol consumption, exercise, and mucositis. Less frequently counseled topics included hair dye, laundry practices, and mask wearing (pre-pandemic).

**Conclusion** This study highlighted that chemotherapy nurses routinely counsel patients on important topics that lack evidence-based recommendations. In the absence of evidence, nurses rely on learned education practices, most commonly institutional guides or recommendations adopted from other nurses or oncologists. On important topics that lack evidence, expert panel review and development of consensus guidelines could standardize and improve the education process for both oncology nurses and patients.

**Keywords** Nursing · Oncology · Chemotherapy · Patient education · Supportive care · United States

## Introduction

Oncology nurses provide a critical component of patient education related to chemotherapy. Their roles include conducting individual sessions with patients beginning a first course or new regimen of chemotherapy, having conversations during the infusion administration itself, and

answering questions from patients in person, by phone, and increasingly through electronic communication. The 2016 Updated American Society of Clinical Oncology/Oncology Nursing Society Chemotherapy Administration Safety Standards section “Treatment Planning, Patient Consent, and Education” is the most relevant resource on this topic [1]. These standards have been translated into Quality Oncology Practice Initiative certification requirements. Included are ensuring patients have been properly informed of their diagnosis, goals of treatment, treatment regimen and schedule, plan for follow-up, and potential adverse events along with their management and how and when to contact the oncology team.

However, many of the practical issues that arise during nurse-patient chemotherapy education fall outside of these topics. Patients often have questions about what they should or should not do different than their usual lifestyle

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while receiving chemotherapy to ensure their own and their families' health and safety. Nurses may counsel patients that certain behaviors should be intentionally initiated or increased, or reduced or avoided entirely, during chemotherapy. Some of the behaviors this applies to include diet, hydration, caffeine and alcohol intake, temperature monitoring, mask wearing, personal hygiene, household chores, pet care, exercise, and sexual activity. We suspected that the lack of available guidelines on these topics might lead to variation in the education patients receive. That variation could occur between nurses, between facilities, and/or between disciplines such as nurses, oncologists, advanced practice providers, and pharmacists. The aim of this project is to describe current oncology nurse patient education practice patterns related to specific patient behaviors

during chemotherapy. It is important to consider that this survey was completed pre-COVID-19 and likely does not reflect current education recommendations (especially considering mask wearing).

## Methods

Our survey was designed for oncology nurses by medical oncologists, oncology nurses, health communication experts, and statisticians. The survey questions were focused on three areas: the education provided, demographic information from nurse survey participants, and resources most influencing current education practice.

**Table 1** Characteristics of survey respondents  $N = 1234^*$

| Variable  | Category  | N (%)       |
|---|---|-------------|
| Gender  | Female  | 1145 (92.1) |
|   | Male  | 22 (1.8)    |
| Race/ethnicity (multiple answers accepted)                    | White   | 1049 (84.4) |
|   | American Indian/Alaskan Native                  | 8 (0.6)     |
|   | Asian   | 34 (2.7)    |
|   | Black or African American                       | 36 (2.9)    |
|   | Hispanic or Latino                              | 41 (3.3)    |
|   | Native Hawaiian or Pacific Islander             | 4 (0.3)     |
|   | Other   | 11 (0.9)    |
| Level of nursing training                                     | RN (Associate' Degree)                          | 267 (21.5)  |
|   | RN (Bachelor's Degree)                          | 611 (49.2)  |
|   | Master's Degree                                 | 215 (17.3)  |
|   | PhD/DNP   | 32 (2.6)    |
|   | Other   | 42 (3.4)    |
| Primary employer  | Academic Hospital/Medical Center                | 258 (20.8)  |
|   | Community Hospital/Medical Center               | 239 (19.2)  |
|   | Community Outpatient Clinic or Private Practice | 352 (28.3)  |
|   | Comprehensive Cancer Center                     | 259 (20.8)  |
|   | Veteran's Administration/Government             | 18 (1.4)    |
|   | Other   | 41 (3.3)    |
| Region  | Midwest   | 341 (27.4)  |
|   | Northeast                                       | 351 (28.2)  |
|   | Northwest                                       | 104 (8.4)   |
|   | Southeast                                       | 234 (18.8)  |
|   | Southwest                                       | 137 (11)    |
| Influences on education practices (multiple answers accepted) | Information from senior/training nurse          | 624 (50.2)  |
|   | Information from colleagues/peer nurses         | 857 (68.9)  |
|   | Information from oncologist                     | 892 (71.8)  |
|   | Website   | 659 (53.0)  |
|   | Handout or protocol from place of employment    | 887 (71.4)  |
|   | Other   | 399 (32.1)  |

\*A total of 76 (6.1%) respondents provided no information and are not included in this table

An anonymous, voluntary, electronic survey was sent to 13,351 Oncology Nursing Certification Corporation (ONCC) members who reported working as an adult outpatient clinic/infusion room oncology nurse in the USA. The survey and reminder e-mails were sent by the ONCC Senior Marketing Manager. Responses were collected between October 15 and October 31, 2019. A reminder e-mail was sent on October 29, 2019. There was no compensation provided for survey completion.

The survey included sixteen education practice questions on the following four topics: eating and drinking, lifestyle behaviors, infections, and medications. Nurses were instructed to answer either yes or no to routinely counseling on each question. Based on the nurse's initial answer, a second, more specific counseling question was asked. Demographic information from nurses was collected on age, gender, race/ethnicity, years of experience, educational level, practice setting, and geographic region. Nurses were asked which of the following most influenced their chemotherapy education practices with multiple answers allowed: senior/training nurse, colleague/peer nurse, oncologist, website, institutional handout. A copy of the survey is available in the supplement. All collected data from the survey was summarized using descriptive statistics.

## Results

Survey responses were obtained from 1243 of 12,995 ONCC-certified nurses (response rate 9.6%). Demographic, training, and employer characteristics of the nurse respondents are displayed in Table 1. The average age was 50.7 years (range 25–76). The mean years of experience was 19.3 (range 1–50). The majority were white (84%) and female (92%). Approximately half had a bachelor's degree while 20% had more advanced degrees. There was a near equal distribution (approximately 20% each) from academic hospitals, community hospitals, community outpatient clinics/private practices, and comprehensive cancer centers. All geographic regions of the USA were well represented with the most responses (55%) being from nurses in the Northeast and Midwest. Seventy-six respondents (6.1%) did not complete the demographic questionnaire.

Nurses report their chemotherapy education practice as being influenced by a variety of sources which was anticipated with multiple responses allowed for this question. Over two-thirds cited peer nurses, oncologists, and institutional handout/protocol. Approximately one-half cited a senior/training nurse or website. Nearly one-third were influenced by another source besides those specifically mentioned in the survey response choices.

Survey results are summarized in Table 2. The percentages provided are out of the total excluding missing responses for each question. Most nurses reported counseling in response to all 16 questions. Topics most counseled on include water intake/hydration, monitoring for infection, alcohol consumption, exercise, and mucositis with more than 90% of nurse respondents educating patients on these topics. Topics least commonly counseled on include use of hair dye, laundry practices, and wearing a mask with approximately 60% of nurses educating patients on these topics. Approximately 90% (1065) of nurses reported counseling differently based on a patient's treatment regimen, while 6.8% (81) provide the same guidance to all patients.

Nurses who answered "yes" regarding counseling on a specific topic were asked a more detailed question on the recommendation provided. The responses to all questions are displayed in Table 3. The percentages provided are out of the total "yes" responses excluding missing response for each question. Most nurses (81.7%) who counsel on caffeine advised patients to limit or reduce consumption. Alcohol avoidance is recommended by 51.4% of nurses who counsel on alcohol. Approximately two-thirds of nurses (68.7%) recommend washing fresh produce twice before consuming. Flushing toilets at least twice after use was recommended by 73.9% of nurses, while 8.2% recommended that chemotherapy patients use a separate toilet than family members. Regarding laundry, 48.6% of nurses recommended washing a patient's clothes separately from other family members' clothes and 10.8% recommended washing clothing twice in hot water. Checking

**Table 2** Survey results

| Do you counsel on... | Yes N (%)   | No N(%)    |
|----------------------|-------------|------------|
| Water                | 1206 (97.2) | 35 (2.8)   |
| Infection            | 1187 (99.7) | 4 (0.3)    |
| Mucositis            | 1161 (97.6) | 28 (2.4)   |
| Exercise             | 1150 (96.1) | 47 (3.9)   |
| Alcohol              | 1108 (90.2) | 121 (9.8)  |
| Medications          | 1038 (87.7) | 146 (12.3) |
| Sexual activity      | 1033 (86.2) | 166 (13.8) |
| Toilet flushing      | 954 (78.6)  | 259 (21.4) |
| Fresh produce        | 920 (75.3)  | 301 (24.7) |
| Cat litter           | 865 (72.1)  | 334 (27.9) |
| Manicure/pedicure    | 829 (69)    | 373 (31)   |
| Sushi                | 825 (67.8)  | 392 (32.2) |
| Caffeine             | 817 (66.3)  | 415 (33.7) |
| Mask                 | 728 (61.1)  | 463 (38.9) |
| Hair Dye             | 722 (59.9)  | 484 (40.1) |
| Laundry              | 633 (52.4)  | 575 (47.6) |

**Table 3** Expanded education practices of nurses providing counseling

| Topic           | Specific recommendations                                       | N (%)      |
|-----------------|--|------------|
| Water           | Amount of water  | 761 (63.1) |
|                 | Both amount and type   | 315 (26.1) |
|                 | Type of water  | 5 (0.4)    |
|                 | Other  | 122 (10.1) |
| Caffeine        | Avoid  | 43 (5.3)   |
|                 | Limit or reduce  | 667 (81.7) |
|                 | Other  | 106 (13)   |
| Alcohol         | Avoid  | 568 (51.4) |
|                 | Limit or reduce  | 408 (36.9) |
|                 | Other  | 130 (11.8) |
| Fresh produce   | Avoid  | 64 (7)     |
|                 | Wash two or more times prior to consuming                      | 630 (68.7) |
|                 | Other  | 223 (24.3) |
| Sushi           | Avoid  | 765 (92.7) |
|                 | Other  | 57 (6.9)   |
| Toilet          | Flush toilets at least twice after use                         | 702 (73.9) |
|                 | Patient should use a separate toilet than family               | 78 (8.2)   |
|                 | Other  | 170 (17.9) |
| Laundry         | Wash clothing twice in hot water                               | 307 (48.6) |
|                 | Wash clothing separately from family member's laundry          | 68 (10.8)  |
|                 | Other  | 257 (40.7) |
| Hair dye        | Avoid  | 577 (79.9) |
|                 | Other  | 141 (19.5) |
| Manicure        | Avoid  | 483 (58.3) |
|                 | Bring own manicure/pedicure tools                              | 189 (22.8) |
|                 | Other  | 154 (18.6) |
| Sexual activity | Avoid  | 5 (0.5)    |
|                 | Use a barrier method such as condoms                           | 914 (88.5) |
|                 | Other  | 113 (10.9) |
| Cat litter      | Avoid  | 602 (69.6) |
|                 | Wear protective equipment                                      | 185 (21.4) |
|                 | Other  | 76 (8.8)   |
| Exercise        | Avoid  | 1 (0.1)    |
|                 | Encourage  | 1012 (88)  |
|                 | Other  | 135 (11.7) |
| Infection       | Check temperature only if you feel ill                         | 751 (63.3) |
|                 | Check temperature twice daily                                  | 246 (20.8) |
|                 | Other  | 186 (15.7) |
| Mask            | Masks should be worn in all public places                      | 249 (34.2) |
|                 | Masks should be worn in chemo clinic                           | 4 (0.6)    |
|                 | Other  | 473 (65.2) |
| Mucositis       | Provide specific guidelines for oral care to prevent mucositis | 929 (80)   |
|                 | Examine mouth daily for sores                                  | 147 (12.7) |
|                 | Other  | 83 (7.1)   |
| Meds            | A specific list regarding what is allowed in provided          | 361 (34.8) |
|                 | Avoid  | 131 (12.6) |
|                 | Other  | 545 (52.5) |

temperature only if a patient feels ill is recommended by 63.5% of nurses, while 20.8% recommend checking twice per day. Mask wearing in all public places was recommended by 34.2% of nurses. The responses to the remaining questions are displayed in Table 3.

Survey respondents identified a variety of additional education topics that were not addressed in the survey. The most frequent responses included dental care, hand-washing, nutrition, sleep, vaccinations, travel, and sun exposure.

## Discussion and conclusion

### Discussion

Over the last 25 years, there have been concerted efforts to standardize the chemotherapy administration process to improve patient safety. More recently, the chemotherapy education process has also been examined and standardized by implementing chemotherapy checklists and education classes. Institutional studies have found that these changes can lead to a statistically significant improvement in nurse satisfaction scores [2]. Our study was the first to explore and describe specific practical lifestyle behavior issues on which oncology nurses provide chemotherapy patient education.

Our data provides insight into a previously uninvestigated yet pragmatic topic. Our survey found that most oncology nurses counsel chemotherapy patients on all sixteen behavior/lifestyle questions asked. Some topics, such as encouraging patients to be physically active or to exercise during treatment [3], are evidence-based. However, literature review of the majority of counseling topics in our survey found no data to suggest recommending that any specific change to usual behavior is necessary for chemotherapy patients. Nurses described multiple influences on their education practices including oncologists, senior nurses, peer nurses, and institutional protocols.

The lack of guidelines may contribute to the conservative or restrictive patient education observed in our survey. For example, there are no case reports of harm to a chemotherapy patient who changed their cat's litter box, yet 72.1% of nurses in our survey counsel against this behavior. One of our survey questions is a topic included in the 2016 ASCO/ONS Chemotherapy Administration Safety Standards, 2.3.8, which is to ensure patients are instructed on "procedures for handling body secretions and waste in the home." There is data demonstrating measurable levels of chemotherapy in family members' urine and in household surface

wipe samples [4–6]. There is no evidence that these levels of exposure are harmful or that a change from usual hygiene practices alters exposure. Commonly used instructions in this setting include advising male patients to urinate sitting down and all patients to flush the toilet twice with the lid down; however, there are no case reports of family members harmed by omission of these practices. Our survey results demonstrate that nurses tend to recommend the most restrictive or conservative option.

There are limitations to our survey data. First, the response rate of 9.6% was low, and thus, the participant nurses may not be representative of the total US oncology nurse population. Second, the question type was intentionally short and simple to facilitate participation. Questions regarding education were thus necessarily general and not based on specific scenarios, diagnoses, or chemotherapy agents.

### Conclusion

Our work identifies an opportunity for quality improvement of nurse-patient chemotherapy education. We have described current practice patterns related to patient lifestyle and behavior topics. Formation of an expert panel to review the relevant literature and develop a consensus guideline could lead to a more efficient, evidence-based, standardized approach for the benefit of both nurses and patients.

**Author contribution** All authors were involved in trial design and manuscript edits. In addition, JK was involved in survey design, BR wrote the first draft, JL and JZ provided statistical support, and KD originated idea.

### Declarations

**Ethics approval** n/a.

**Consent to participate** n/a.

**Consent for publication** Include appropriate statements.

**Conflict of interest** The authors declare no competing interests.

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